

2019 Aquatic and Riparian Restoration Annual Report



**USDA Forest Service
Pacific Northwest Region**



for the greatest good

USDA Forest Service Pacific Northwest Region 2019 Aquatic and Riparian Restoration Annual Report

During our preparation of this annual report, I continue to be amazed at the diversity of significant actions we take each year to address legacy impacts to watersheds. Protecting and restoring our aquatic and riparian ecosystems provides countless natural resource benefits to the public. These include producing salmon and steelhead and other aquatic species for recreational and commercial use, clean and plentiful water for downstream communities, agriculture, and industry, and beautiful natural areas in and around water for recreational pursuits. We're maximizing these benefits by focusing our efforts on implementing multi-year restoration plans in priority watersheds. The projects included in this report and many others helped us finish work in nine of those watersheds this year and make progress in many others.

It is important to note, we would not be able to do this work without our partners. In fact, for every \$1 we invest in watershed restoration, monitoring, and outreach, our partners provide another \$2.1 overall. This partner match to limited Forest Service funds is even greater (recently as much as 4:1) in partnership emphasis programs such as the Regional Challenge Cost Share and Drinking Water Providers Partnership initiatives. These funds are crucial to attract partner investment to our work and without them, much of this work would not occur. We look forward to continued collaboration in aquatic and riparian restoration and watershed management.

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Colville National Forest

West Branch LeClerc WRAP

A Watershed Restoration Action Plan (WRAP) was prepared for the West Branch Le Clerc Creek sub-watershed, which is 21,654 acres and 70% National Forest System (NFS) lands. There is evidence of successful spawning by migratory bull trout in West Branch LeClerc Creek. This is one of three watersheds on the Colville National Forest where this threatened species is known to occur. West Branch LeClerc Creek also contains a viable population of genetically pure westslope cutthroat trout, considered by the USFS as a sensitive species. The LeClerc watershed is important to the Kalispel Tribe as a place for subsistence fishing for native salmonids.

The West Branch has been affected by eroding road surfaces delivering fine sediment to the aquatic habitat, a lack of large woody debris (LWD) and boulders decreasing stream channel complexity, fish migration barriers at road crossings and

dams, and previously logged riparian areas. Essential Projects identified for this WRAP included aquatic passage projects, instream placement of LWD and boulders, road removal and relocation, and stream channel reconstruction.

To complete this WRAP, the forest restored 3 miles of West Branch LeClerc Creek altered by mill operations. The floodplain was re-established, 700 large trees and root wads were placed in the stream, 2 barrier culverts were replaced to provide aquatic passage and downstream bedload transport, 3 undersized culverts were removed to restore aquatic stream function and structure, and 2 miles of eroding streamside road were fully decommissioned. Three legacy dams were removed with a FS blasting crew and an excavator, restoring access to 18 miles of high quality habitat, and 2 miles of closed road were fully obliterated, restoring natural conditions to 15 headwater stream crossings.



Left: A view from 375' above LeClerc Creek, including the restored floodplain, 200 pieces of large wood and boulders added, and the location where a log cribbing dam was removed.



Left: A legacy crib dam (12' high x 24' deep x 60' wide) affected fish passage and downstream bedload movement. The dam stored nearly 450 yds³ of sediment.

Below right: Upstream view of restored stream channel of West Branch LeClerc Creek post blast of legacy crib dam.



External Partners in this endeavor include Kalispell Tribe of Indians, the Lands Council, Stimson Lumber Company, Washington Department of Fish and Wildlife, and Washington Recreation and Conservation Office – SRFB. Multiple resources across the forest helped to achieve this restoration, including Wildlife, Archeology, Botany, Fire & Fuels, Engineering, Timber, Soils, Fisheries, and Hydrology. The work was funded by 25% appropriated funds (\$386,000), and 75% partner funding (\$1,130,200).

For more information on this project contact Rob Lawler, Zone Hydrologist, Newport/Sullivan RD, 509-447-7319. For other restoration projects on the Colville National Forest, contact Karen Honeycutt, Natural Resources Program Manager (Fisheries, Wildlife, TES, Soil and Water), 509-684-7224.



Above left: Downstream view of West Branch LeClerc Creek pre-blast of legacy crib dam.



Above right: Dynamic channel restoration ten months post breach of legacy crib dam.

Columbia River Gorge National Scenic Area Little Wind River Habitat Enhancement

The Columbia River Gorge National Scenic Area (CRGNSA) partnered with the Underwood Conservation District, Washington State Salmon Recovery Board, Bonneville Power Administration, Inter-fluve, and several private landowners to restore fish habitat, improve stream function and stability, and plant native riparian vegetation in approximately 0.5 miles of the Little Wind River. The purpose of this project is to enhance habitat for federally listed Lower Columbia River Chinook salmon, coho salmon, steelhead, and their designated critical habitats. The habitat objectives are to increase high quality spawning and rearing habitat by increasing channel complexity and improving floodplain and off-channel connectivity.

The 2019 work continues from where the previous year's work left off. This is considered the fourth phase of habitat enhancement work on the Little Wind River. The project area is located in the Columbia River Gorge National Scenic Area on private and National Forest System (NFS) lands. Previous project phases (I-III) began at the

confluence of the Little Wind River and Wind River, and worked upstream, creating pools, constructing riffles, placing wood in the river, and planting riparian vegetation.

In Phase IV, 78 large whole trees with rootwads and 25 small wood bundles were provided by a nearby private landowner. The trees and bundles were airlifted by helicopter for placement in the Little Wind River channel and floodplain, and for constructing large wood jams for habitat enhancement. Riparian alders and conifers were thinned to also provide a source of wood for instream placement. Additionally, 200 conifers and 50 native riparian shrubs were planted.

For further information about the project and other projects on the CRGNSA, please contact Brett Carré, Fish and Wildlife Program Manager, 541-308-1718 or Diane Hopster, Watershed Program Manager, 541-308-1732.



Slash bundles and large wood transported and placed by helicopter.

Deschutes National Forest Ryan Ranch Slough Restoration

The Deschutes National Forest, in partnership with the Upper Deschutes Watershed Council, the Oregon Watershed Enhancement Board, Central Oregon Irrigation District, and Oregon Division of State Lands, implemented the Ryan Ranch wetland and streambank restoration during Fiscal Year 2019. The project re-established the hydrologic function of a river/slough system by re-connecting a historic slough basin with surface flows from the Deschutes River.

The project lowered nearly 0.3 miles of artificial berm along the Deschutes River and reconnected two historic inlet/outlet channels between the river and the slough basin. It also re-located an existing berm away from the river and installed two footbridges over the inlet/outlet channels to maintain the Deschutes River Trail through the area. Nearly 40,000 sedge plugs were acquired from Clearwater Nursery and planted on the new floodplain.



Wet meadow conditions pre-project (top) and emergent marsh post-project (bottom).

Re-located berm with footbridge supporting the trail (top) and newly planted river floodplain (bottom).

For more information about this project contact Peter Sussmann, Soil Scientist at 541-383-5594. For other restoration projects on the Deschutes National Forest, contact Jason Wilcox, Fisheries Program Manager at 541-383-5534 or Jason Gritzner, Forest Hydrologist at 541-383-5537.

Fremont-Winema National Forest Sevenmile Fish Screen and Passage

The Nicholson Diversion withdraws water from Sevenmile Creek on US Forest Service (USFS) property approximately 1.2 miles upstream of Sevenmile Ranch. This diversion can divert a majority of the stream flow (21.5 cfs) and was unscreened and outdated. The diversion is situated downstream from the majority of quality bull trout critical habitat, Oregon spotted frog habitat, and redband trout spawning habitat. The unscreened diversion posed a significant entrainment risk to all aquatic species.

In partnership with Trout Unlimited and private landowners, a new head gate and a vertical panel were installed. Also installed was a paddle wheel driven, self-cleaning fish screen in the irrigation ditch. The screen helps eliminate entrainment of the aquatic species in Sevenmile Creek. Also, as a part of this project, the access road to the diversion was improved for safety and to decrease sediment runoff into the stream. A gate was installed to protect the diversion structure from unauthorized access.

For more information on this project contact Kyle Gomez, Westside Fish Biologist, 541-883-6734. For other aquatic restoration projects on the Fremont-Winema Forest, contact Phillip Gaines, Forest Fish Biologist, 541-947-6258 or Don Kozlowski, Forest Hydrologist, 541-947-6284.

Top: Pre-project, Looking downstream at an old board structure used to control flows for the diversion ditch.

Middle: Pre-project, Looking from the irrigation canal towards Sevenmile Creek. Water free flowed without any screen on the diversion, transporting aquatic species into the ditch and irrigated fields.

Bottom: Looking towards Sevenmile Creek at head gates at the entrance to the irrigation canal. New head gates allow for more control of flows down the irrigation ditch and facilitates screening.



Gifford Pinchot National Forest Road Decommission Stewardship

Forest Road 4610-018 Decommission Project was two miles of a twenty-two mile project identified by the Pinchot Partners. Previously, thirteen miles were treated. The objective of the project was to restore natural hydrology and stream function to support aquatic species (Pinchot Partners Restoration Project Decision Notice 2010). Purcell Creek was the one fish bearing stream in the project area. The Pinchot Partner Stewardship Project secured \$527,000 of retained receipts for the twenty-two decommission miles. FR 4610-018 decommission costs approximately \$45,000.

The project will restore natural flow function and stream bed and banks; remove thirty other road stream crossings or ditch relief culverts, re-establish natural flow paths and decrease connectivity of concentrated ditch flow, and eliminate the risk of catastrophic culvert failures during high flow events.

For more information regarding aquatic restoration projects on the Gifford Pinchot National Forest, please contact Ruth Tracy, Soil and Water Program Manager, 360-891-5112.



Purcell Creek looking upstream



Purcell Creek looking downstream



Initiation of Forest Road 4610018 removal from Purcell Creek



Streambank erosion control of Purcell Creek

Malheur National Forest Camp Valley Restoration

The Camp Valley Restoration Phase I project was within the Lower Camp Creek subwatershed, Camp Creek watershed, and Middle Fork John Day subbasin (a priority restoration watershed). Restoration actions were identified in the Camp Creek watershed restoration action plan and consultation and analysis were completed in 2013 and 2014. Camp Creek and its tributaries contain 32.1 miles of designated Middle Columbia River steelhead critical habitat.



Removal of a hazard tree from campground to be used in the restoration project.

The purpose of this project is to restore instream and floodplain complexity, promote beaver habitat, expand riparian vegetation, elevate water tables, facilitate sediment deposition for stream bank building and channel narrowing, increase quality pools, and reconnect floodplains isolated by legacy berms. These actions promote watershed health and increase water throughout the system, increasing survival rates of threatened juvenile Middle Columbia River steelhead currently impacted by high water temperatures and suffering high mortality rates. The area was identified as a priority area for treatment because of the unconstrained valley bottoms, floodplain extent, low gradient, vegetation for beaver habitat and potential to store water. The area is also identified as having a high capacity for juvenile steelhead rearing, a main limiting factor in Camp Creek.

We constructed 85 primary wood jams and 89 secondary floodplain or side channel wood structures on three miles of Camp Creek and the tributaries of Trail and Lick Creeks. We also planted 2,500 rooted willows within the floodplain. Legacy berms were removed throughout the project, and approximately three miles of side channel were reconnected to the mainstream. Trees for the project were obtained by thinning encroaching conifers in 5 acres within the outer riparian habitat conservation area boundary.



Channel-spanning wood structures within low-gradient valley bottom areas, reconnecting the side channels.

The project was made possible through a partnership with the Confederated Tribes of Warm Springs Reservation of Oregon and assistance (through the Good Neighbor Authority) from Oregon Department of Fish and Wildlife, Oregon Natural Desert Association, and the North Fork John Day Watershed Council. The Confederated Tribes of Warm Springs Reservation of Oregon was instrumental in providing matching funds through Bonneville Power Administration.

For more information on this project, contact Dan Armichardy, Fisheries Biologist, 541-575-3391. On other aquatic restoration projects on the Malheur National Forest, please contact Tom Friedrichsen, Forest Hydrologist at 541-573-4329.

Mt. Baker-Snoqualmie National Forest West Fork White River Bridge Removal

The West Fork White River originates from the Winthrop Glacier on Mt. Rainier and flows through a wide valley of multiple channels and an unstable floodplain.

November 2006, a two-day storm brought record-breaking rainfall to the area, falling on ground already saturated. It caused snow levels to rise above 10,000 feet. As a result of this and subsequent storm events, the approaches to a 100-foot long concrete bridge spanning the river washed away, leaving the free-standing bridge. The bridge had continually suffered damage since 1982, increasing the need for costly repairs. In 2008, the river channel continued to shift across the unstable floodplain, taking out significant sections of Forest Service Road 74. A decision was made, due to repair costs and resource impacts, to remove the bridge and not re-establish a crossing.



The 100-foot concrete bridge was demolished in chunks and the debris removed. Once the bridge deck was removed, the remaining piers were cut two feet below the stream grade. Any remaining road fill from the bridge approaches was removed from the channel migration zone, totaling 2,234 cubic yards. The accumulation of woody debris at a bridge pier was utilized during restoration along the excavated roadway and in the channel. Asphalt surfacing totaling 3,976 square yards was removed from 0.4 mile of the approach road.

The project was funded with appropriated dollars specifically intended for flood sites from the 2007 and 2008 storms. The money was put into an agreement with the Federal Highway Administration, who delivered the construction contract valued at \$531,500.

A primary tributary to the White River, the West Fork White River is designated critical habitat for three fish species federally listed as threatened: Puget Sound Chinook salmon, Puget Sound steelhead, and bull trout. Other salmonid species utilizing the West Fork White River include coho, pink, and chum salmon, and coastal cutthroat trout.

For more information on this project and other aquatic restoration projects on the Mt. Baker-Snoqualmie National Forest, contact Richard Vacirca, Fisheries Program Manager at 425-783-6040.



View of the bridge site looking upstream before (left) and after removal (right).

Mt. Hood National Forest Jones Creek Restoration

The Jones Creek Restoration project was completed in cooperation with the Confederated Tribes of the Warm Springs Reservation of Oregon, The Bonneville Power Administration, Oregon Watershed Enhancement Board, Ecotrust Forest Management, and the Hood River Watershed Group. It is an Essential Project in the Upper West Fork Hood River Watershed Restoration Action Plan (WRAP).

The project addresses the lack of large wood as a primary factor limiting the natural production of spring Chinook salmon in the West Fork Hood River (WFHR). Logging activities in the early part of the 20th century reduced in-stream large wood recruitment potential from riparian areas and increased sediment transport. The practice of splash dams, where rivers like the WFHR were used as log flumes to transport logs to mills downstream, greatly altered the river channel not only funneling all the flow into a single-thread channel where water velocities were increased in a “firehose”-like effect, but it also stripped the riverbed of all components of habitat, including spawning gravel, cobble, pools, and large wood. Additionally, a railroad used for logging terminated in the riparian area at the upstream end of the project reach.



The purpose of this project was to restore aquatic habitat and stream function for all aquatic species, and to contribute to the recovery of spring Chinook salmon, ESA-listed summer steelhead, and coho. The overall goal was to restore salmonid spawning and rearing habitat within the treatment reach by placing large wood in the stream, side channels, and floodplain and by

reconnecting remnant and active side channel habitats to the main channel. Restoration actions were designed to maintain or improve the connections between the channel and floodplain, collect and sort spawning sized gravel, increase habitat complexity in side channels and maintain river processes that ensure side channel formations/stability.



Ten to 15 log jams (10-25 logs each, approximately 400 logs total) were added to the stream channel, side channels, and associated floodplain of the WFHR from the confluence with Ladd Creek upstream ~0.6 miles to the confluence with Jones Creek (River Mile 13.8 – 14.4). A heavy-lift helicopter was used to stage the logs, many of which had root-wads, near implementation sites. A 300-class excavator was used to build the log jams and to place wood in the side channels and floodplain. Approximately five whole trees in the riparian area were pulled over by the excavator and incorporated into the log structures. Upon instream project completion, 0.5 mile of road access to the project area and a dispersed camping site in the riparian area were decommissioned, and a gate was installed. Project implementation time was 17 days and project cost was \$162,500.

For more information on this project, contact Darcy Saiget, District Fisheries Biologist, Hood River RD, 541-352-1222. For more information on other aquatic restoration projects on the Mt. Hood National Forest, contact Todd Reinwald, Watershed Program Manager, 503-668-1769.



Vertol helicopter staging logs in the West Fork Hood River near Jones Creek.



The access road to the West Fork Hood River and a dispersed campsite in the riparian area near the confluence with Jones Creek were decommissioned as part of the restoration project.



A splash dam built in the West Fork Hood River during logging activities around 1911. Habitat in the stream channel and floodplain was significantly degraded for decades by this logging practice, causing the need for restoration.

Ochoco National Forest

Deep Creek Floodplain Restoration

The primary goals of this project are to protect and restore riparian and watershed function, improve water quality, and increase the stream complexity, quantity, and quality of habitat for multiple species in the lower gradient reaches of Deep Creek. The purpose and need for these restoration activities are to enhance and recover habitat for Forest Service sensitive aquatic species such as redband trout and Columbia spotted frog and other riparian dependent and aquatic animals and plants. The Watershed Condition Framework categorized this sub-watershed as “Functioning at Risk” and Deep Creek is 303(d) listed for water temperature with important fish populations surviving in cool, disconnected refuges. Despite these conditions, Deep Creek remains the highest value spawning habitat and a genetic stronghold for native redband trout within the Crooked River Basin.

Hydrologic function and habitat were restored through aggrading the stream bottom, large wood placement, and riparian planting. The Stage 0 restoration technique was used, returning the channel bed to a pre-disturbance elevation through aggradation. In most cases, that pre-disturbance condition is a multi-thread system of channels and wetlands, hydrologically connected. Restoring hydrologic connectivity to Deep Creek using this technique has transformed 1.5 miles of Deep Creek into what is now anticipated to become a wet meadow with side channels and oxbows. This involved converting the single-thread, confined and incised channel into multiple shallow dispersed channels and wetlands throughout the valley floor, resulting in greatly reduced stream power during high flows with the

water table closer to the surface for most of the year. This change in water table elevation is leading to significant beneficial changes in the riparian vegetation supported in the valley.



Before (above) located at the top of the project, equipment is preparing for channel de-watering. Deep Creek is bermed (off camera to the right), abandoning the rest of the valley during low flows to the left. After (below), base flow is spread across the valley into smaller channels with a constructed oxbow in the foreground and wood material incorporated.



While this recharged soon-to-be wet meadow and channel has tremendous natural revegetation potential, we will follow-up with planting, focusing on the old Deep Creek channel path to ensure stability and restore species diversity. Although we used over 400 large pieces of wood, additional woody material will be added to further address the limiting factors to healthy watershed processes, including providing more fish cover, roughness to slow flow and accumulate sediment, cover from wildlife and cattle browsing for young plants, and cattle deterrents away from saturated soils. A riparian pasture fence has been established around the entire valley section, ridge to ridge. Grazing will be excluded from the pasture for at least 3 years. After that, the riparian pasture is planned to be grazed under short duration. This flash grazing is expected to be an effective strategy because beaver habitat and woody material will be maintained, protecting saturated conditions in the valley bottom. Recent thinning and burning will enhance upland forage opportunities to support uniform cattle dispersal across the pasture.

For more information about this project on the Ochoco National Forest, contact Cindy Quezada, District Hydrologist at 541-416-6434. Forest-wide information is available through Jason Wilcox, Forest Fisheries Biologist at 541-383-5534 or Jason Gritzner, Forest Hydrologist at 541-383-5537.

Before (top), located at the beginning of the project, Deep Creek is bermed (off camera to the left) abandoning the rest of the valley to the right. During implementation (middle), Deep Creek is diverted and material is stockpiled. After (bottom), base flow is spread across the valley into smaller channels with constructed habitat features and wood material is incorporated to add roughness across the flood-plain.



Okanogan-Wenatchee National Forest Box Canyon Creek Wood Replenishment

The Box Canyon Creek wood replenishment project was completed in late summer 2019. The project represented several years of planning, led by Mitch Long of Kittitas Conservation Trust and supported by a variety of partners. Design work was led by Robes Parrish of US Fish and Wildlife Service, in conjunction with Mitch Long and District Fish Biologist Eric Merten, and followed the procedures prescribed by the current Aquatic Restoration Biological Opinion. Helicopter operations were completed by Columbia Helicopters and overall funding was provided by the Yakima Basin Integrated Plan.

A total of 429 pieces of wood were added to Box Canyon Creek as a part of this project. Each piece was an entire tree, with some branches missing. One third of the pieces had rootwads intact. Although approximately 50 pieces were brought in from off Forest, a large portion were designated hazard trees from nearby campgrounds, benefiting the safety of campground users

in addition to aquatic habitat. The project used a closed system road as the staging area for the wood. When the project was completed, preexisting culverts were removed from the road, the staging area was decompacted and seeded, and the road was reclosed.

The primary objective of the Box Canyon wood replenishment project was to provide velocity refugia for juvenile bull trout in this high-energy stream system. Washington Department of Fish and Wildlife is leading monitoring efforts, including long-term snorkeling and redd count data collection in the project area.

For more information on this project or other aquatic restoration projects on the Okanogan-Wenatchee National Forest, contact Emily Johnson, Fisheries Program Manager at 509-664-9326.



Olympic National Forest

Pysht River Fish Barrier Removal

The Olympic National Forest, the Environmental Protection Agency, and the U.S. Fish and Wildlife Service partnered to remove two undersized, deteriorated culverts that were fish passage barriers and close 2.2 miles of unstable system roads in the headwaters of the Pysht River. The Pysht River sub-watershed has degraded fish habitat conditions as a result of past logging practices, including harvest in riparian zones and road building activities that have reduced available inputs of large woody debris necessary for complex fish habitat. High road densities and erodible soils have led to road failures, increased sediment delivery to fish habitat, and fish passage barriers.

This project reconnected five miles of habitat for coastal cutthroat trout, restored natural river hydrology, and reduced potential for large road failures and sediment delivery into the Pysht River. Partners were key to meeting Watershed Condition Framework restoration and sustainable infrastructure objectives.

Project accomplishments included 5 stream miles enhanced, 11.2 watershed acres improved, and 2 fish passage barriers removed at a total project cost of \$352,678. Cost share included EPA (27%), USFWS (46%), and Olympic National Forest (27%).

For more information on this project or other aquatic restoration projects on the Olympic National Forest, contact Dana Butler, Watershed Program Manager at 360-956-2280 or Tammy Hoem, Fisheries Program Manager at 360-956-2293.



Above: Mainstem Pysht River culvert crossing prior to removal, looking downstream. Upper right: Coastal cutthroat captured during pre-project fish salvage. Bottom right: complete removal of barrier.

Rogue River-Siskiyou National Forest Taylor Creek Repair and Restoration

The Taylor Creek Repair and Restoration Project, located on the Wild Rivers Ranger District, Rogue River-Siskiyou National Forest, was completed in March 2019, following the 2018 fire season. Taylor Creek is a tributary to the Rogue River within the Wild and Scenic section of the river. This priority watershed provides high quality habitat for federally listed Southern Oregon and Northern California Coasts (SONCC) Coho salmon, SONCC fall Chinook salmon, Klamath Mountain Province (KMP) winter steelhead, Pacific lamprey, and resident salmonids.



The rugged topography within the Taylor Creek Watershed contradicts the relatively low gradient and high quality fisheries habitat found within the stream itself.

The 2018 fire season was historic in the Rogue Basin. A widespread lightning event in mid-July ignited over 75 fires across the basin and several of these fires continued to burn through October. Two of the largest fires were the Taylor Creek Fire and the Klondike Fire, which combined and eventually burned over 175,000 acres. Many of the anadromous reaches of Taylor Creek experienced very active burn periods in the early days of the fire, which resulted in extensive tree mortality across much of the late-seral riparian reserve.

The 2018 fire season was the first time that Incident Management Teams (IMTs) tasked with suppressing wildfires also treated hazard and danger trees along roadsides and near recreation sites. While many of these trees were decked along roadsides, a large number of trees were also felled directly into Taylor Creek or within its active floodplain.



The winter of 2018/2019 brought a number of active storms that mobilized much of the danger tree material that had been felled along Taylor Creek. These trees created at least three large jams within the active channel of Taylor Creek, two of which were considered a potential threat to the road.

An IDIQ contract with Blue Ridge Timber Co allowed staff on the RRSNF to quickly implement a repair plan that would reduce potential impacts to the road, while preserving the habitat benefits created

by the large pulse of organic material following the fire. Engineering, fisheries, and watershed staff worked closely with the contractor to re-adjust materials in the most prominent logjams to direct high flow energy away from the road, while keeping most of the jam intact. Blue Ridge Timber's tree puller and cable yarding system were key pieces of equipment to preserve the integrity of the jams.

This project, while fairly small in scope, represents what may become a common practice on Forests across the region: using Incident Management Teams to treat hazard and danger trees along stream corridors with roads and recreation sites. While many of these trees would have delivered naturally to the stream over time following the fire, the active falling of hundreds of trees along several miles of Taylor Creek created an uncharacteristic pulse of material in Year 1.

For more information about this and other aquatic restoration projects on the Rogue River-Siskiyou National Forest, please contact Steve Burns, Fisheries Program Manager, 541-618-2052.



Steep slopes in the headwaters of the Taylor Creek watershed that burned in the Onion Mountain Fire of 2014.



Siuslaw National Forest Jewel Creek Culvert Replacement

The Lower Jewel Creek Culvert Replacement Project removed the last fish passage barrier on Jewel Creek, a high priority project for the Salmon SuperHighway initiative.

This project replaced three side-by-side 42 x 60-inch, 40-foot long culverts with a concrete bridge across Jewel Creek, tributary to Sand Creek in Tillamook County. Jewel Creek is considered the most productive tributary in the basin for salmon; providing summer and winter rearing habitat for juveniles and spawning habitat for adult salmonids. It also maintains relatively high flows throughout the summer, making it an important cold water refugia for fish. Anadromous fish species include coho, winter steelhead, fall Chinook, chum, cutthroat, and lamprey.

The three side-by-side culverts were the last remaining fish passage barriers in the Jewel Creek basin after replacing two crossings on private land upstream of the project site in 2017 and 2018. Restoring access to over three miles of key anadromous habitat, this project is an important piece of the Salmon SuperHighway fish passage partnership. The partnership has a goal of improving fish passage throughout the drainage.

The project was a collaborative effort led by the Nestucca-Neskowin Sand Lake Watersheds Council to improve fish passage in the watershed. The Siuslaw National Forest assisted with engineering, hydrologic and geomorphic assessments, bridge design, and project implementation oversight. Other partners included the US Fish and Wildlife Service, Tillamook County Public Works, Cascade Pacific Resource Conservation and Development, Natural Resource Conservation Service, and Oregon Department of Fish and Wildlife.

The total project implementation cost was approximately \$549,884, with over \$75,000 in cash and in-kind support from Tillamook County Public Works, over \$125,000 from the USFS Joint Chiefs initiative funding, \$10,000 from USFWS, \$222,809 from Oregon Watershed Enhancement Board, and \$75,000 from Columbia Pacific Resource Conservation and Development.

For more information on this project and other aquatic restoration projects on the Siuslaw National Forest, contact Brandy Langum, Fisheries Program Manager at 541-750-7034 or Kami Ellingson, Watershed Program Manager at 541-750-7101.



Jewel Creek Project before (top) and after (bottom).

Umatilla National Forest

Little Phillips Creek Restoration

Little Phillips Creek is important habitat for federally listed Snake River steelhead. The purpose of this project was to remove a culvert from Little Phillips Creek at the junction of Oregon Highway 204 and Forest Road 3734, to improve public safety and enhance aquatic habitat.



The FR 3734 culvert barrier killed an estimated thousands of Snake River steelhead during the past decades as fish become stranded in the out-let scour pool in an intermittent stream reach.

The stream crossing was a 60-inch corrugated metal pipe estimated to be about 45 years old. Holes were worn in the bottom of the culvert and it was starting to show signs of buckling. The culvert was immediately adjacent to highway 204, causing the Oregon Department of Transportation to express concern about the potential failure of the culvert that could put highway traffic at risk. The undersized culvert was also a fish passage barrier and created an outfall pool that trapped and killed juvenile ESA-listed Snake River steelhead every summer as water levels dropped and sections of the stream went dry. The section of Forest Road 3734 directly above the culvert was steep and eroding, continuously delivering sediment to Little Phillips Creek.

Due to safety and habitat concerns, the decision was made to remove the aging culvert and to decommission 0.7 mile of FR 3734 to reduce sedimentation. Alternate public access was provided by reopening the opposite end of FR 3734. Once the culvert was removed, the stream channel and floodplain were restored to natural conditions and approximately 10 miles of fish habitat were reconnected and open to passage upstream of the project.



Pre- (above) and Post-(below) project.



For more information on this project and other aquatic restoration projects on the Umatilla National Forest, please contact Brien Park, Watershed Program Manager and Forest Soil Scientist, 541-278-3822 and Kathy Ramsey, Forest Fisheries Biologist, 541-278-3933.

Umpqua National Forest

South Fork Steelhead Creek AOP

South Fork Steelhead Creek, an important tributary to Steamboat Creek within the newly created “Frank and Jeannie Moore Wild Steelhead Sanctuary,” had an impassable culvert which prevented fish passage at the Forest Road 3809000 crossing. The habitat upstream from the culvert had been effectively blocked to fish and other aquatic species passage since 1964. The bedrock dominated conditions at the site were extremely challenging and represented the most difficult aquatic organism passage restoration project attempted to date on the Umpqua National Forest.

The project reconnected a mile of quality habitat for winter steelhead. Funds used for construction included appropriated road funds, external grant

funds, and North Umpqua Hydropower Mitigation Funds.

The total cost of the aquatic organism passage project was \$520,000, with partners contributing 10% of those funds. These partners included National Fish and Wildlife Foundation and the Bring Back the Natives Program.

For more information on this project, please contact Ron McMullin, District Fisheries Biologist, North Umpqua RD, 541-496-3532. For other aquatic restoration projects on the Umpqua National Forest, contact Bob Nichols, Fisheries Biologist at 541-825-3134 or Joe Blanchard, Watershed Program Leader at 541-957-3356.



Pre-project Steelhead Creek crossing perched outlet.



The outlet of the post-project Steelhead Creek aquatic organism passage crossing.

Wallowa-Whitman National Forest Sheep Creek WRAP

A Watershed Restoration Action Plan (WRAP) was prepared in 2011 for the Sheep Creek Watershed. Sheep Creek and its tributaries are critical spawning and rearing habitat for ESA-listed Snake River Basin spring Chinook salmon and summer steelhead, critical habitat for Columbia River Basin bull trout, and R6 Regional Forester's sensitive species listed redband trout and Pacific lamprey.

The specific objectives of the WRAP were to eliminate artificial fish passage barriers, reconnect floodplains to stream channels, reduce miles of road in riparian areas, decrease road densities within the watershed, improve streambank stability, increase amount of large woody debris in channels (all channel types), improve stream width to depth ratios, decrease water temperatures in summer months toward meeting ODEQ standards, and recover riparian vegetation.



Fine wood placement in Sheep Creek.

Legacy land management greatly compromised watershed structure and function, including floodplains, montane meadows, and fish habitat. Major activities that contributed to the long term impairment of ecological function include removal of beavers and their dams, intensive livestock grazing, and logging and associated high road densities in locations directly and indirectly impacting hydrologic run off patterns and fish passage. These activities resulted in fish migration barriers/habitat fragmentation, incised, single thread channels disconnected from meadows, wetlands, and floodplains, loss of riparian vegetation, and simplified, poor quality aquatic and riparian habitat.

Since 2011, the forest has accomplished 10.3 miles of road storm proofing to address sedimentation problems, 6 miles of instream habitat restoration work for floodplain restoration and fish habitat, 4 miles of perennial fish bearing stream area excluded from cattle grazing, an additional mile of wet meadow excluded from grazing (perennial non-fish bearing stream), and 4 aquatic organism barriers on perennial fish bearing streams corrected.



Helicopter placement of large wood in Sheep Creek.



Sheep Creek, newly constructed Aquatic Organism Passage Structure (2016).

The work was funded by \$1 million appropriated funds, and \$1.7 million from partners including Confederated Tribes of the Umatilla Indian Reservation, Trout Unlimited, Bureau of Land Management, Bonneville Power Administration, Oregon Watershed Enhancement Board, and National Forest Foundation.

A robust monitoring plan including vegetation transects, fish habitat, inundation from aerial imagery during run off and base flows will be implemented.

For more information on this project contact: Sarah Brandy, District Fisheries Biologist, Wallowa-Whitman National Forest, 541-962-8590.



Willamette National Forest Lower Coal Creek Project

In June 2019, the Middle Fork Ranger District and Middle Fork Willamette Watershed Council worked together to restore 25 acres of floodplain habitat in lower Coal Creek in the Upper Middle Fork Willamette Watershed. Historically, this location was a place where substrates and wood coming down from the Coal Creek sub-watershed deposited to create several complex channels and high quality habitat for spring Chinook, bull trout, and a host of other native species. Past management removed the wood and channelized the flow into one channel instead of many. By concentrating the flow in a single channel and removing the wood, stream power was greatly increased and all fine sediments and organic material were washed out, much to the detriment of native fish and wildlife species.



The partnership applied for and received \$275,000 to match an equal amount invested by the Forest Service (planning, design, implementation and wood value) to jointly design a Stage 0 project that addressed the degraded condition. Haley Construction LLC was hired by the Council to complete the project, which involved moving 8,000 cubic yards of material and placing over 800 pieces of wood, many with root wads attached. Volunteers worked with the partnership to do fish rescue before the down-cut channel was dewatered and filled to historic floodplain elevation.

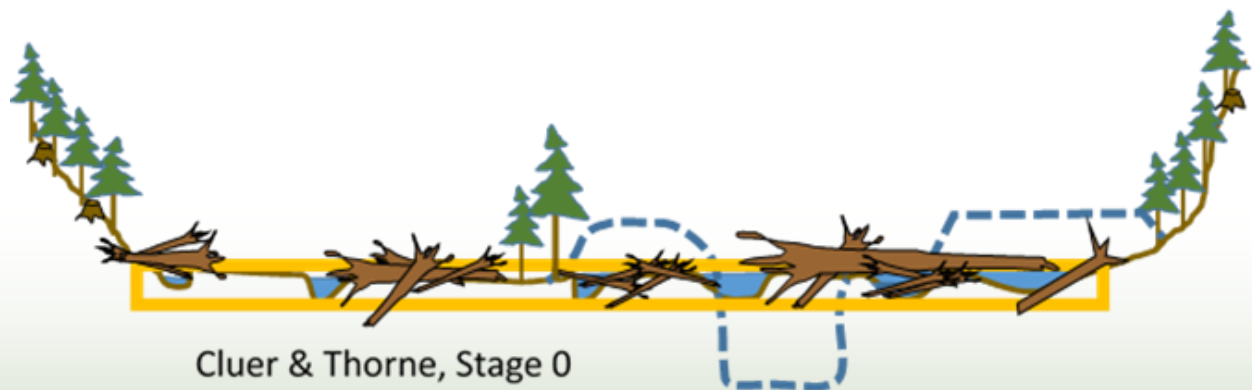
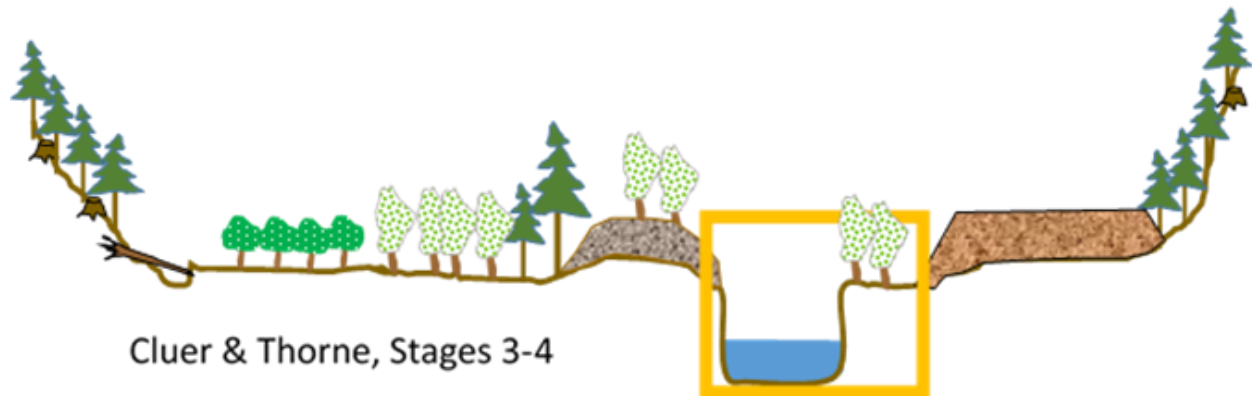
As part of the project, 0.6 miles of the Middle Fork Trail was moved out of the Coal Creek Floodplain. An additional 2.1 miles of single track is being built to connect the Coal Creek section with the current upstream section of trail which will remove the last significant road section of the 30+ mile Middle Fork Trail. The public will eventually be able to hike and mountain bike near the restored floodplain where once again, water flows through several shallow channels, creating the kind of habitat historically used by native species.

Funders included the Forest Service, Oregon Watershed Enhancement Board, Portland General Electric, National Forest Foundation, and Travel Oregon.

For more information on this project and other aquatic restoration projects on the Willamette National Forest, contact Johan Hogervorst, Forest Hydrologist, at 541-225-6430 and Brett Blundon, Forest Fisheries Biologist at 541-225-6439.



Stage 0, process-based restoration at Coal Creek



Locations of Forest units in the Pacific Northwest Region of the USDA Forest Service





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